

# What is

## SYSTEMS & CONTROL ENGINEERING?

***An undergraduate program at  
Case Western Reserve  
University***

## Answers to Frequently Asked Questions

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### **Could you become a Systems and Control Engineer?**

Systems and Control Engineers are general purpose problem solvers. They know a lot about many different things, and a great deal about putting things together. Systems and Control Engineers often serve as the technical managers and leaders in interdisciplinary projects.

If you are a "big picture" person, with strong abilities in mathematics, good communication skills, and if you like to solve problems and make things work, then this may be the career for you.

### **Who Hires Systems and Control Engineers?**

Our students are sought for their interdisciplinary and problem solving, skills. Employers include large companies, small startups, and many medium size companies that need technical team members for complex engineering design and analysis problems. They are hired by the control engineering companies (Rockwell Automation, Picker, Keithley, Honeywell), the automobile companies (Ford, GM) computer companies (IBM, Lucent, Bellcore) by the aerospace industry (GE, JPL, NASA, Boeing), by companies with manufacturing concerns (Intel, Goodrich, GE, Proctor & Gamble), by power companies, and by government agencies.

## What do Systems and Control Engineers do?

Systems and Control Engineers are the people who "put things together" to make systems do what they want them to do. In complicated devices, such as automobile anti-lock braking systems, aircraft flight controllers, robotic manufacturing assembly lines, rate-adaptive pacemakers, multimedia computer-communication systems and advanced petrochemical refineries, the skills and talents of mechanical engineers, electrical engineers, chemical engineers, metallurgists, and computer engineers are often required. *But it is the systems and control engineers who put all of the component subsystems together, to coordinate and integrate the efforts of different specialists.* Systems and Control Engineers are trained in the skills and tools that bring together the efforts of several engineering fields, to make things work efficiently and well - to make things happen!

## Is the Systems and Control Program at CWRU well ranked?

Yes. We are ranked as the #2 Systems Engineering Program in North America, in the Gourman Report (9th edition, 1996).

## Is the Systems and Control Program at CWRU accredited.

**Yes.** We were the first systems program to be ABET accredited in the United States.

## How big is the program?

We currently have 7 faculty, 35 undergraduate majors, and 50 graduate students. The program is housed in the Electrical Engineering and Computer Science department at CWRU and is engaged in about \$1 million research per year. Sponsors include NIH, NSF, EPRI, US-AID and corporate partners.

## What kind, of courses do Systems and Control majors take?

The Systems and Control program contains required courses as well as optional ones. Required courses include topics such as *Engineering Optimization, Computer Simulation, Systems Modeling., Control Systems Design and Analysis, Signal Analysis, Decision Theory and Engineering Economics*, as well as advanced mathematics and statistics courses. Students take courses from many other engineering departments. There are three elective sequence options within the major:

- *Control Systems* - automation, control, and signal processing, with electives in robotics and machine intelligence
- *Systems Analysis* - modelling, optimization, decision making and computer simulation, with electives in operations research and management
- *Manufacturing and Industrial Systems* - production and manufacturing systems, with electives in management and automation.

In addition to course work, there are "hands on" laboratory courses, as well as computer-based laboratory experiences. The senior year includes a design project where students apply what they have learned in course work, often in an interdisciplinary, team setting. Also, all engineering majors at Case take core engineering courses and options in the sciences and mathematics, together with a selection of humanities and social sciences.